

Environmental Quality Commission Public Meeting

Energy Issues in the Commonwealth
Governor's Office of Energy Policy
May 10, 2007



Governor's Office of Energy Policy

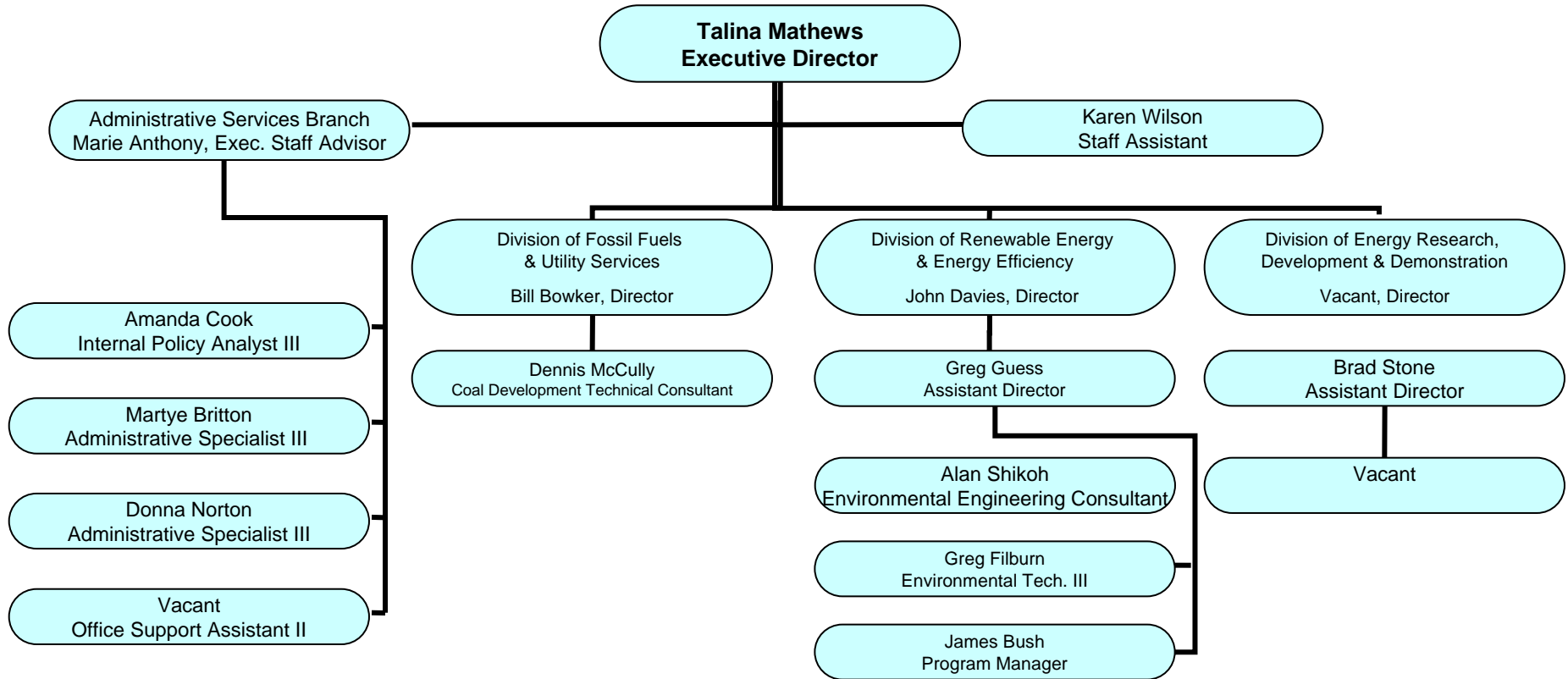
Formed in June 2005 as an Office within the Commerce Cabinet; Moved to Governor's Office, October 2006

Three Divisions:

- Division of Research, Development and Demonstration
- Division of Renewable Energy and Energy Efficiency (DRE3)—formerly the Division of Energy from EPPC
- Division of Fossil Fuels and Utility Services (DFFUS)—formerly the Kentucky Coal Council

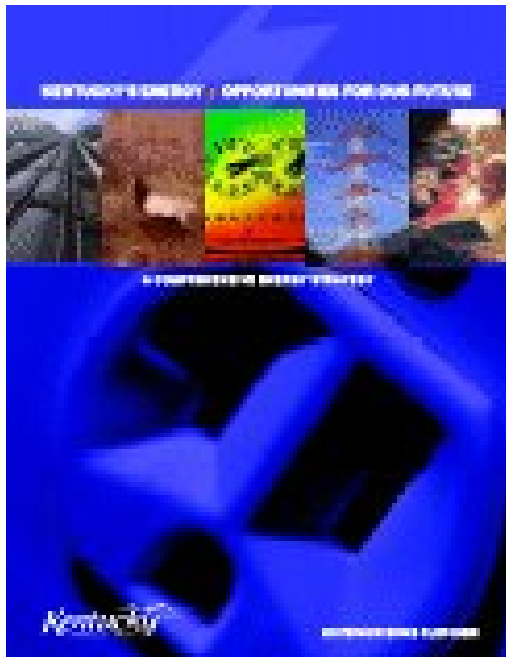


GOEP Organizational Chart



GOEP Mission

- Implement the 54 Recommendations in the *Governor's Comprehensive Energy Strategy*



Guiding Principles:

- Maintain Kentucky's low cost energy
- Responsibly develop Kentucky's energy resources
- Preserve Kentucky's commitment to environmental quality

Comprehensive Strategy

To address Kentucky's unique energy situation:

- More than 95% coal-fired electric generation
- Nearly one-third of U.S. coal mines
- Third in U.S. coal production
- 7th highest per capita energy consumption
- Relatively low electricity rates
- Heavy industrial economy, 45% v 34%, US
- Significant oil & gas, oil shale resources
- Abundant biomass potential
- 43rd in U.S. per capita income



Comprehensive Energy Strategy: Objectives



- Promote value-added energy industries
- Promote energy-efficiency in all end-use sectors
- Encourage development & use of alternative fuels and unconventional fuels and renewable energy resources
- Promote energy-related university RD & D
- Facilitate technology exchange
- Assist in leveraging federal research dollars

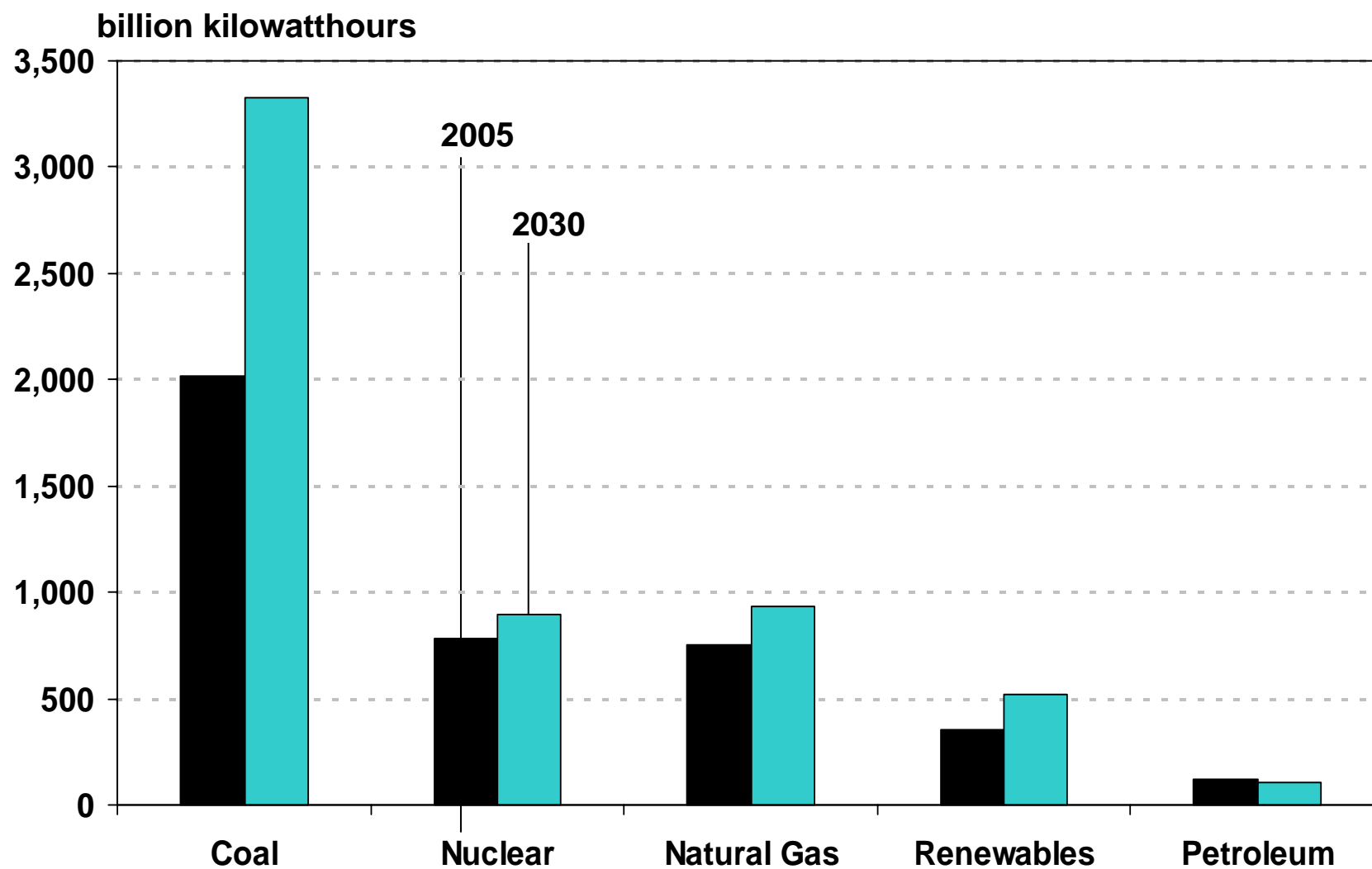


Energy Issues & Trends

- Increasing Demand for Electricity
 - 50% increase in nationwide electricity consumption 2004-2030
 - Ky. will need additional 7000 MW by 2025 (2005 assessment by PSC)
 - Coal likely to be fuel (federal & PSC estimates)
- More stringent environmental regulations—CAIR, CAMR
- Increasing dependence on imported oil and natural gas
- Nationwide push to develop alternatives to conventional oil and natural gas imports
- New generation will be more expensive
- Potential Carbon restrictions—U.S. Supreme Court Ruling, bills in Congress, House Select Committee



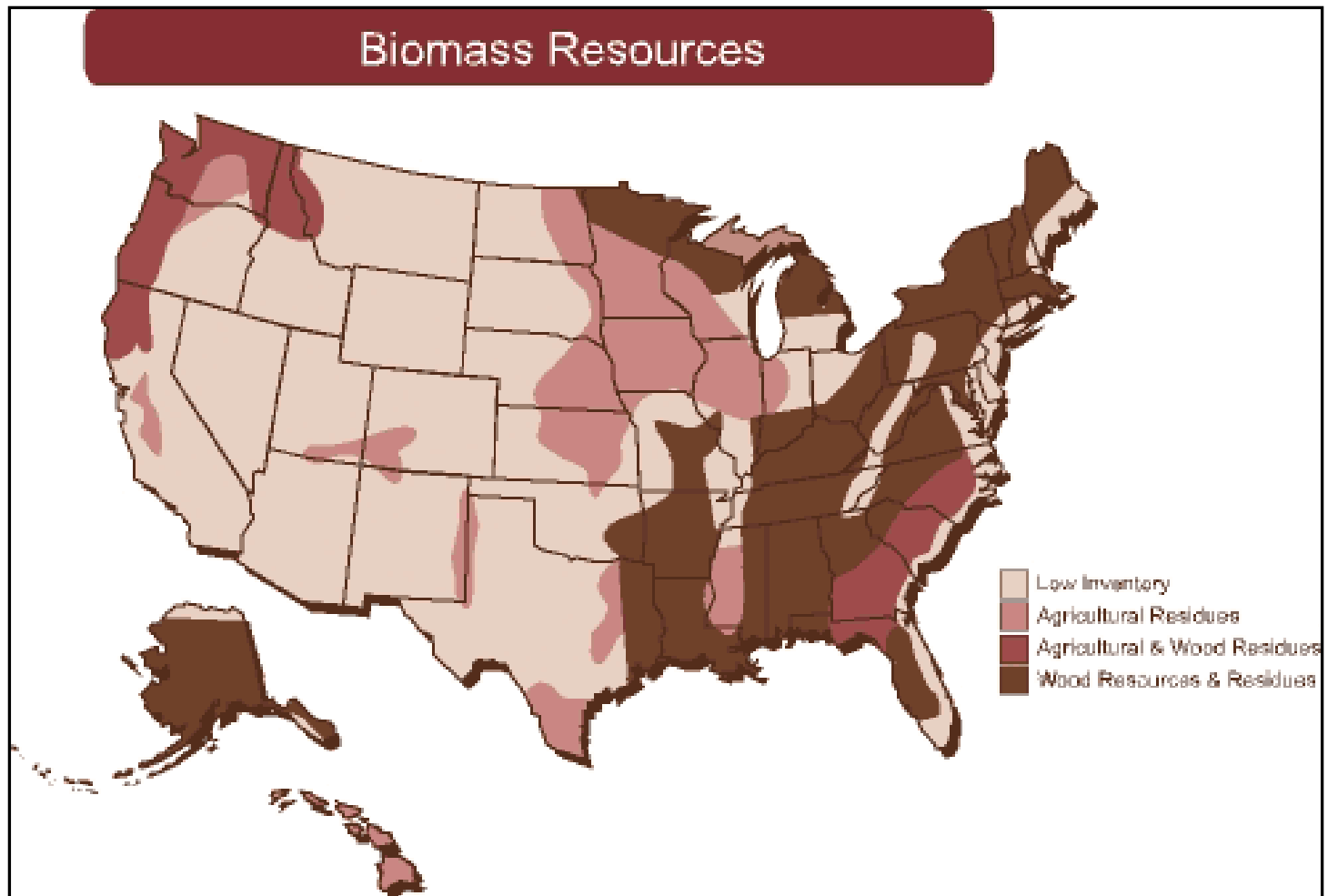
Electricity Generation by Fuel, 2005 and 2030



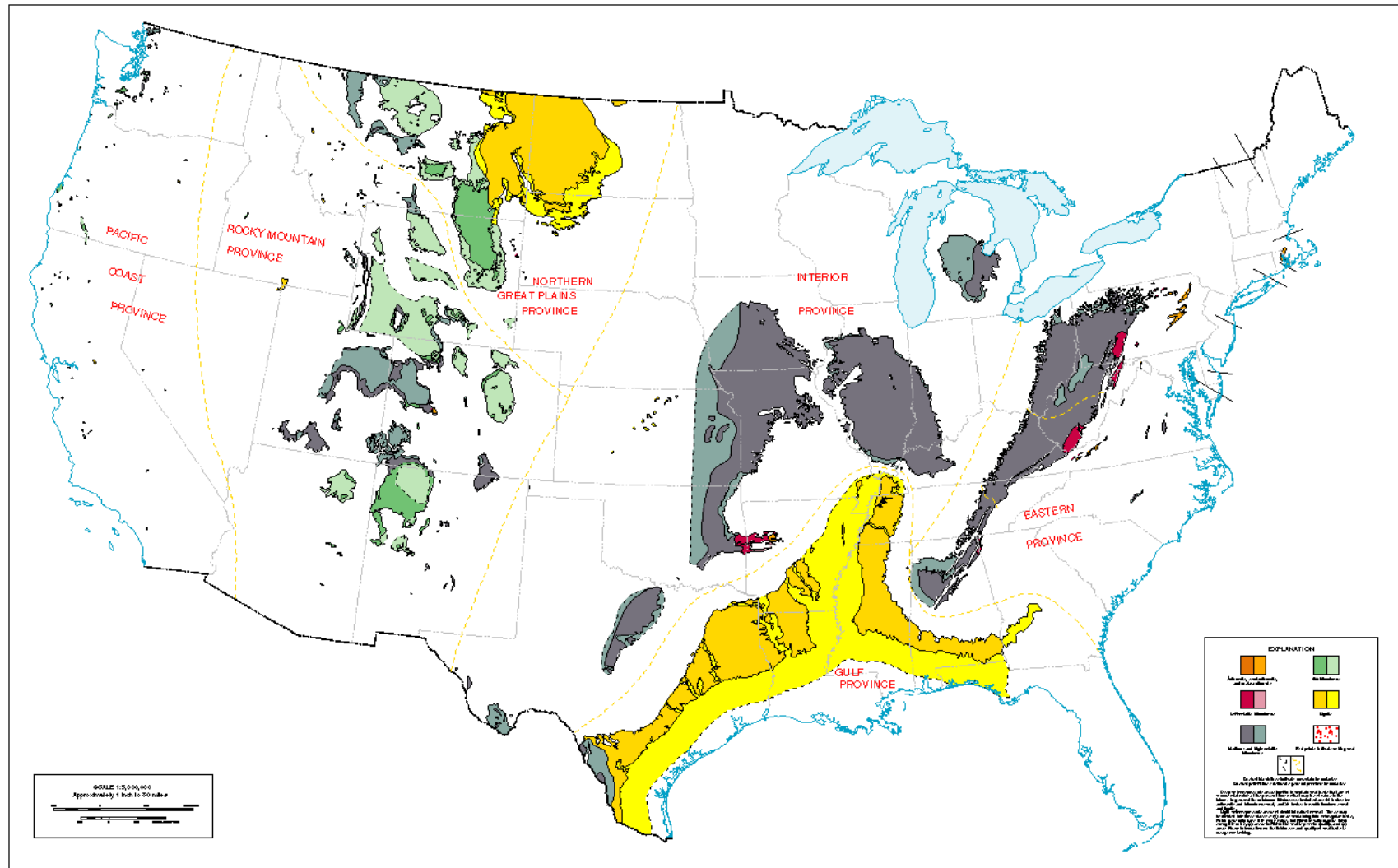
Energy Information Administration, Annual Energy Outlook, 2007



Biomass Resources



Coal Resources



Energy Strategy Update

Full status report will be released this spring. Activity is on-going, covering areas in all 54 of the recommendations, such as:

- In 2006 Kentucky became only the fourth state in the nation to be declared an ENERGY STAR partner by the U.S. DOE and U.S. EPA.
- Kentucky now has 7 ENERGY STAR schools
- \$95,176 grant from GOEP to UK to promote energy efficiency education throughout the Commonwealth
- Kentucky Rural Energy Consortium Launched
- \$70,000 in Energy Grants Awarded to the Kentucky Clean Fuels Coalition
- State Motor Pool Fuel site is now all ethanol
- Electricity Infrastructure Assessment—PSC's comprehensive assessment of Kentucky's electricity infrastructure
- Mine Safety Legislation & Substance Abuse in Mines Legislation



Research, Development & Demonstration

Program Focus:

- Provides funding support to increase energy R&D capacity at Kentucky's public universities
- Encourages knowledge and technology exchange between universities, national energy laboratories, and private industry
- Facilitates the universities' ability to leverage research funding from federal and private sources
- Administers KEDFA Clean Coal and Applied Energy funds:
 - Commercial energy related industrial projects or technologies
 - Projects related to industrialization of Kentucky's energy resources



Research, Development and Demonstration

Highlights

FY06

- \$464,423 awarded in matching grants leveraged \$2.2 million in federal and private funds
- \$848,000 in seed grants to universities
- \$2 M in KEDFA funds for Clean Coal Research
- \$600,000 in KEDFA funds for Applied Energy Research

FY 07

University Research Matching grants solicitation open
Grant agreements established to award \$3.5 million in commercialization grants

\$518,192 to be awarded before June 30 for energy efficiency & renewable energy research

\$450,511 to be awarded before June 30 for other energy research areas



Recent Projects Funded

Partial listing of recent projects funded by GOEP

UK Biosystems & Ag Engineering

- Canola and Sunflower for Oil/Biofuel Production in Kentucky

UK Plant & Soil Sciences

- Improving Biodiesel Production Efficiency

The UK Department of Mining Engineering -- three projects:

- Thin-Seam Coal Resources
- Fine Coal Recovery by Froth Flotation
- Improved Energy Efficiency and Economic Recovery of Eastern Kentucky Coal Using Clean Coal Technology

The UK Center for Applied Energy Research will receive funding for two projects:

- High Value Applications for Flue Gas Desulphurization Materials
- Feasibility of Capture and Utilization of CO₂ from Kentucky Power Plants by Algal Systems

University of Louisville, Department of Chemical Engineering

- Industrial Wood Wastes as a Renewable Energy Resource



Renewable Energy & Energy Efficiency

Program Focus

Maximize the benefits of energy efficiency & renewable energy through awareness, technology diffusion, partnerships, and resource leveraging in all end-use sectors:

- Schools
- State Government
- Residential Sector
- Industrial Sector
- Commercial Sector



Renewable Energy & Energy Efficiency

Division Highlights:

- Earth Day & ENERGY STAR, “Change A Light” grants to schools, community groups, other non-profits
- Awarded University of Louisville over \$170,000—Energy efficiency assessments, EE programs for schools, study of EE potential in Kentucky
- Partnered with UK to secure \$500,000 federal grant—teach builders & the public about benefits of EE buildings, strengthen partnership between UK’s Cooperative Extension Service and KCTCS & the state.
- Fourth state to be designated Energy Star Partner; seven schools have received Energy Star designation
- Active member of the Kentucky Rural Energy Consortium and the Kentucky Clean Fuels Coalition



Renewable Energy & Energy Efficiency

Opportunities & Events

- Appalachian Regional Commission renewable energy and energy efficiency grants competition (June 30 closing date)
- June workshops on residential energy efficiency and HVAC systems, 3 locations around the state
- June Energy Conference for Educators, conducted by KY NEED



Fossil Fuels & Utility Services

Program Focus:

Increase the economic opportunities and benefits to Kentucky citizens and industry through expansion of current markets and development of market opportunities for:

- coal
- natural gas
- petroleum
- oil shale
- tar sands
- liquid and gaseous fuels
- chemicals from coal



Fossil Fuels & Utility Services

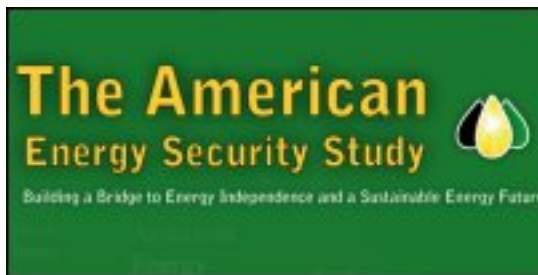
Recent Program Activities

- \$46,000 to UK to develop a consortium of oil and gas industry partners to encourage long-term natural gas exploration in Kentucky.
- Strategic Unconventional Fuels Task Force
- Coal Education Grants
- On-going fossil energy RD & D grants (highlighted in several sections of this presentation)
- Southern States Energy Board, ***American Energy Security***—calls for production of domestic transportation fuels through coal liquefaction to reduce country's vulnerability to price shocks and supply disruptions and enhance overall national security; calls for increased efficiency and use of biomass resources.



Fossil Fuels & Utility Services

- House Bill 299, Ky. Energy Security National Leadership Act—Directs GOEP to develop a strategy for production of transportation fuels and synthetic natural gas from fossil energy resources and biomass
- Southern States Energy Board (Governor Fletcher, State's Co-Chair), *American Energy Security* —calls for production of domestic transportation fuels through coal liquefaction to reduce country's vulnerability to price shocks and supply disruptions and enhance overall national security.



- United States imports 60% of its oil
- Indirect costs to U.S. economy
~\$300 billion/yr



Industrial Energy Facilities



Advanced Energy Technologies:

- cleaner transportation fuels
- synthetic natural gas
- electricity
- chemicals
- potential for carbon capture and storage

Benefits of Initiatives

- Value-Added Industries
- Market for Kentucky coal & biomass resources
- Increased employment opportunities
- Carbon sequestration potential through advanced technologies
- Environmental protection
- Economic development and national security
- Significant monetary savings and environmental protection benefits through energy efficiency



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